

Applicant : Kevin Francis Dolman  
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Attorney's Docket No.: 21503-0002US1 / P51952.US

### Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application.

### Listing of Claims

1. (Currently Amended) A method of producing a chromium carbide-containing ferroalloy welding consumable material for subsequent use for producing a hardfacing on a suitable substrate comprising the steps of:
  - (a) ~~melting at least two solid feed materials to forming a homogeneous melt, with at least one of the materials being a source of free carbon, the homogeneous melt having a required concentration of carbon, from a chromium-containing ferroalloy material and a source of free carbon with the step including melting the chromium-containing ferroalloy material and the source of free carbon at a melt temperature and holding the melt temperature to dissolve carbon in the melt and manganese for a chromium carbide-containing ferroalloy welding consumable material; and~~
  - (b) ~~forming, from the melt, a solid carbide-containing ferroalloy welding consumable material having a concentration of chemically combined carbon such that a chromium/carbon ratio is less than 7.0 and having a chromium content in a range of 30-65% by weight from the melt, wherein the melt temperature is held for a time sufficient to produce the concentration of chemically combined carbon in the ferroalloy welding consumable material.~~

2-4. (Cancelled)

5. (Previously Presented) The method of claim 1 wherein step (a) comprises adding graphite to the melt to supersaturate the melt with carbon.

6. (Previously Presented) The method of claim 1 wherein step (a) comprises forming the homogeneous melt with an iron-containing material other than a chromium-containing ferroalloy

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to dilute the chromium concentration in the melt.

7. (Cancelled)

8. (Previously Presented) The method of claim 1 comprising de-gassing the melt formed in step (a) so that the solid ferroalloy welding consumable material formed in step (b) facilitates a stable welding arc in a subsequent hardfacing operation and thereby minimises porosity in the resultant hardfacing and eliminates ejection of ferroalloy powder from the weld pool.

9. (Previously Presented) The method of claim 1 comprising removing slag from the melt formed in step (a) so that the solid ferroalloy welding consumable material formed in step (b) minimises the presence of non-metallic impurities in the resultant hardfacing weld deposit formed in the subsequent hardfacing operation.

10. (Cancelled)

11. (Cancelled)

12. (Previously Presented) The method of claim 1 wherein the ferroalloy welding consumable material has a chemically combined carbon content greater than 7.5 % by weight

13. (Previously Presented) The method of claim 1 wherein step (b) comprises casting the melt into a suitable mould(s) or other casting means and thereafter breaking up the cast product into a suitable form, such as powder form.

14. (Previously Presented) The method of claim 1 wherein step (b) comprises atomising the melt with a suitable gas to form solid powder from the melt.

15. (Previously Presented) A chromium carbide-containing ferroalloy welding consumable material produced by the method of claim 1.

16. (Cancelled)

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17. (Cancelled)

18. (Previously Presented) The material of claim 15 wherein the chemically combined carbon content is greater than 7.5 % by weight.

19. (Previously Presented) A method of producing a hardfacing weld deposit on a suitable substrate comprising:

forming a weld pool of chromium carbide-containing ferroalloy welding consumable material produced by the method of claim 1; and

welding wire material on a substrate and thereafter depositing a hardfacing weld deposit of material from the weld pool on the substrate.

20. (Original) A hardfacing weld deposit on a suitable substrate produced by the method defined in claim 19.

21. (Cancelled)

22. (Previously Presented) The weld deposit of claim 20 comprising a chromium content of less than 35 % by weight.

23. (Previously Presented) The weld deposit of claim 20 comprising a combined carbon content greater than 4.0 % by weight.

24. (Previously Presented) The weld deposit of claim 23 comprising tungsten and/or vanadium and/or titanium and/or molybdenum and/or niobium and/or boron up to a maximum of 15 % by weight.

25. (Previously Presented) The method of claim 6, wherein the iron-containing material is selected from the group consisting of scrap steel and scrap high chromium white cast iron.

26. (Previously Presented) The method of claim 14, wherein the suitable gas is argon.

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27. (New) The method of claim 1, wherein the melt temperature is held for 30 to 60 minutes.